

The purpose of this Revised Analysis of Impacts to Public Trust Resources and Values (Revised APTR)¹ is to provide information to the California State Lands Commission (CSLC) and its staff, regarding the potential impacts of the Broad Beach Restoration Project (Project), proposed by the Broad Beach Geologic Hazard Abatement District (BBGHAD), to public trust resources and values. The BBGHAD is seeking approval from the CSLC, through the issuance of a 20-year lease, for the portions of the proposed Project on state sovereign lands. Generally, the CSLC relies on an environmental review pursuant to the California Environmental Quality Act (CEQA; Pub. Resources Code, § 21000 et seq.) to assess a project's impacts to its lands and associated resources and uses. However, implementation of the Project by the BBGHAD is statutorily exempt from CEQA as an “[i]mprovement caused to be undertaken ... and all activities in furtherance thereof or in connection therewith, shall be deemed to be specific actions necessary to prevent or mitigate an emergency....” (Pub. Resources Code, §§ 26601 & 21080, subd. (b)(4).) This statutory exemption precludes the CSLC from conducting a review under CEQA. **Therefore, this Revised APTR serves solely as an informational document to assist the CSLC in deciding whether to issue a lease for portions of the Project within its jurisdiction**

The Project includes: (1) restoration of approximately 46 acres of beach and sand dunes primarily overlying state sovereign land at Broad Beach, in the city of Malibu, Los Angeles County (Figure ES-1), using an estimated 600,000 cubic yards (cy) of sand hauled from commercial quarries in Ventura County, and (2) continued use of this sovereign land by limited portions of an existing, 4,100-foot-long, emergency rock revetment. The CSLC did not previously authorize this revetment, and the BBGHAD is also seeking approvals from other agencies for the revetment to remain in place.

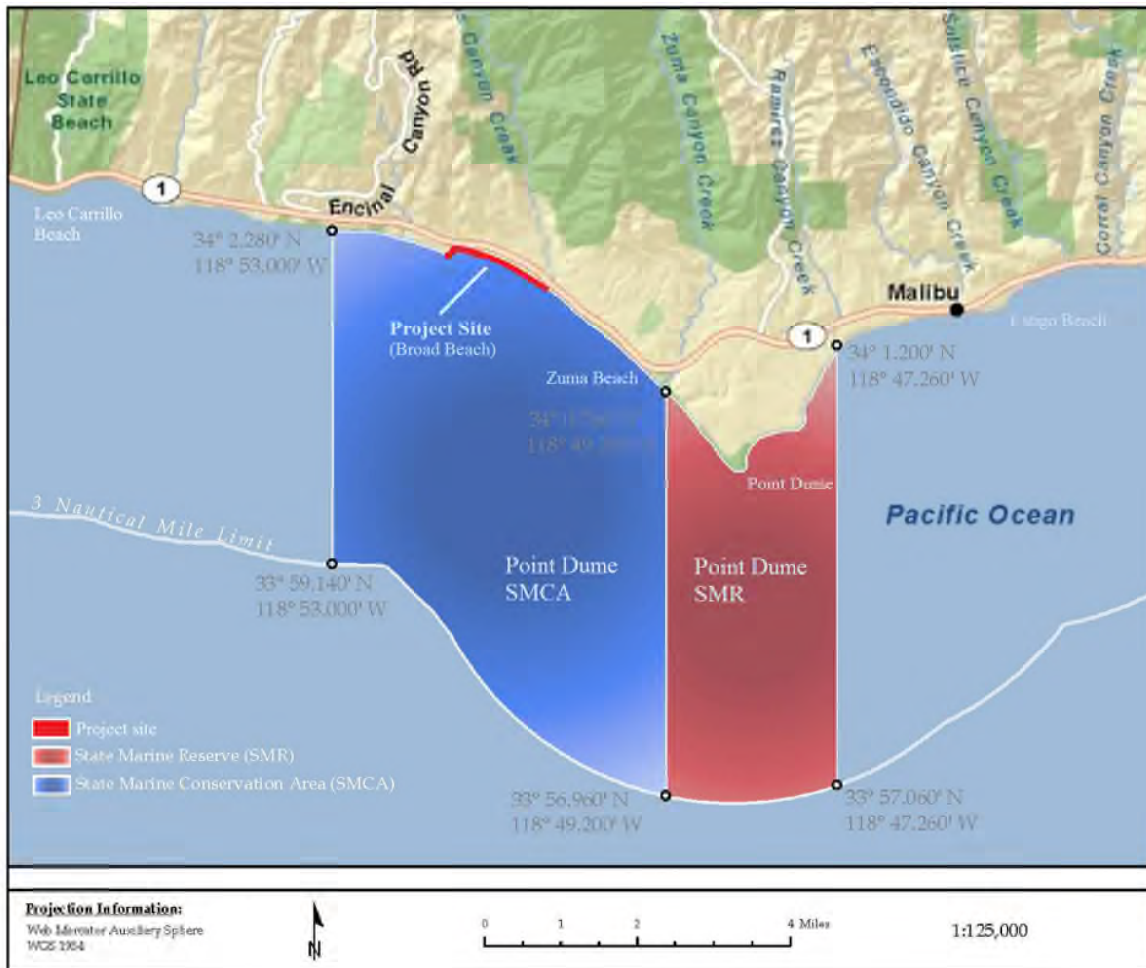
The Broad Beach area lies within the Point Dume State Marine Conservation Area (SMCA), a Marine Protected Area (MPA) created pursuant to the Marine Life Protection Act (MLPA; Fish & G. Code, §§ 2850-2863; added by Stats. 1999, Ch. 1015, Sec. 1), which extends from Encinal Canyon in the north to Westward Beach in the south. This area is also adjacent to the Point Dume State Marine Reserve (SMR), which begins at Westward Beach, and continues around Point Dume to the west end of Paradise Cove (see Figure ES-2).²

¹ This Revised APTR replaces a Draft APTR released in October 2012.

² MPA means “a named, discrete geographic marine or estuarine area seaward of the mean high tide line or the mouth of a coastal river, including any area of intertidal or subtidal terrain, together with its overlying water and associated flora and fauna that has been designated by law, administrative action, or voter initiative to protect or conserve marine life and habitat. An MPA includes marine life reserves and other areas that allow for specified commercial and recreational activities ... provided that these activities are consistent with the objectives of the area and the goals and guidelines of [the MLPA]....” (Fish & G. Code, § 2852, subd. (c).)



Figure ES-2. Marine Protected Areas in the Project Area



Source: Adapted from CDFW 2011.

As described in this Revised APTR, the BBGHAD's Project area encompasses all of the following three areas:

- **CSLC Lease Area:** state sovereign lands that the BBGHAD is seeking to lease, including numerous Lateral Access Easements (LAEs) held by the CSLC;
- **Public Trust Impact Area:** includes the CSLC Lease Area and the following adjacent areas: (1) offshore and down coast of Broad Beach; (2) Broad Beach Road; and (3) sections of the sand transport route for the Pacific coastline section of State Route 1 (Pacific Coast Highway [PCH]) to the Project site;³
- **BBGHAD Inland Project Area:** Project areas outside the Public Trust Impact Area and CSLC's jurisdiction, specifically three quarries in Ventura County and the sand transportation routes inland from the Pacific coastline section of PCH

³ As a Trustee agency, the CSLC has a trust responsibility for projects that could directly or indirectly affect sovereign lands, their accompanying Public Trust resources or uses, and the public trust easement in navigable waters.

APTR PURPOSE AND SCOPE

This Revised APTR analyzes potential impacts of the Project against the existing environmental setting or baseline. To the extent possible, using available information, the Revised APTR also considers the existing setting prior to installation of sand bag revetments and the emergency rock revetment under emergency permits. In addition to examining adverse and beneficial effects of the Project on public trust lands and resources, the Revised APTR identifies avoidance and minimization measures (AMMs) to lessen impacts and maximize public benefits associated with the Project's use of state sovereign lands and describes Project alternatives that may lessen or eliminate adverse Project effects. The Revised APTR addresses affected resources within the BBGHAD Inland Project Area for qualitative informational purposes.

THE PUBLIC TRUST DOCTRINE AND PUBLIC TRUST LANDS

The origins of the Public Trust Doctrine are traceable to Roman law concepts of common property. Under Roman law, the air, the rivers, the sea, and the seashore were incapable of private ownership; because they were dedicated to the use of the public (Institutes of Justinian 2.1.1). Under English Common Law, this principle evolved into the Public Trust Doctrine whereby the sovereign held the navigable waterways and submerged lands as a trustee, for the benefit of the people. Upon admission to the Union in 1850, California, as a sovereign state, received title to public trust lands (i.e. the tide and submerged lands and navigable waterways) within its borders, in trust, for the benefit of the public. These lands are to be used to promote the public's interest in water dependent or water oriented activities. The Public Trust Doctrine and California's Constitution establish the right of the public to access and use public trust lands, as well as the public's right to fish on public trust lands (Cal. Const. Article X, Section 4; Cal. Const. Article I, Section 25).

The California Legislature has delegated to the CSLC exclusive control and jurisdiction over ungranted public trust lands. (Pub. Resources Code, §§ 6216, 6301). The CSLC also retains the remaining State authority over lands that have been legislatively granted in trust to other governmental agencies (Pub. Resources Code, § 6301). The CSLC implements the Public Trust Doctrine through careful consideration of its principles and the exercise of discretion within the specific context and location of proposed uses. In administering its trust responsibilities, the CSLC exercises its discretionary authority in the best interests of the State, accommodating the changing needs of the public while preserving the public's right to use public trust lands for the purposes to which they are uniquely suited. The California Department of Fish and Wildlife (CDFW), Department of Water Resources, and Department of Parks and Recreation also have responsibilities over certain public trust resources.

PROJECT HISTORY AND OBJECTIVES

High erosion rates during the 2009-2010 winter season and widespread failure of then-existing temporary emergency rock, sandbag and geotextile revetments led the Trancas Property Owners Association to apply to the city of Malibu and California Coastal Commission (CCC) for emergency coastal development permits (CDPs) to construct an emergency rock revetment.⁴ At that time, the emergency rock revetment was accepted as the minimum action necessary and the least environmentally damaging alternative to implement the interim shore protection required for structural stability of Broad Beach homes, and to protect public health by preventing accidental releases of sewage effluent related to threatened septic system leach fields. Approximately 36,000 tons of rock were placed along Broad Beach adjacent to homes located between 30760 and 31346 Broad Beach Road. The existing emergency revetment is approximately 4,100-foot-long, rises approximately 12 to 15 feet above average low tide elevation (mean lower low water [MLLW]), is approximately 22- to 38-foot-wide at its base, and covers approximately 3.02 acres of beach. In 2011, the city of Malibu approved the BBGHAD's formation, and the BBGHAD submitted a lease application to the CSLC for the proposed Project. The BBGHAD's Project objectives are as follows:

- Protect existing homes, structures, and other improvements – including septic systems – from ongoing coastal erosion along Broad Beach;
- Create and maintain a wide sandy beach backed by a restored dune system similar to that which historically occurred along this reach of coastline;
- Provide for enhanced public access along Broad Beach while maintaining homeowner beach access and privacy through establishment of consistent lateral access along the beach; and
- Restore and enhance native dune habitats along Broad Beach and add sandy intertidal habitat to support native fauna (e.g., grunion, shorebirds).

PROJECT DESCRIPTION

Components of the BBGHAD's proposed Project include (see Table ES-1):

- Permitting of the as-built 2010 emergency rock revetment and any associated storm drain improvements within and through the revetment and to the beach for a 20-year period (this includes the use of unpermitted rock material deposited at the west end of Broad Beach in 1997-1998 pursuant to emergency CDPs, and subsequently reused as part of the 2010 as-built emergency rock revetment);

⁴ Between 1997 and 1998, rock was deposited at six properties along Broad Beach Road under emergency CDPs. Several thousand feet of sand bag or geotextile revetments were also later installed by individual homeowners. The rock was relocated and used as part of the 2010 emergency revetment, and many of the sand bag and geotextile revetments were covered by the emergency revetment.

Table ES-1. Broad Beach Restoration Project By the Numbers (Proposed Project)

Project Setting	
Beach length (from Lechuza Point to Trancas Creek Lagoon)	~6,200 feet
Estimated volume of sand lost from Broad Beach: 1974-2009	600,000 cy
Current sand loss rate at Broad Beach	35,000-45,000 cy/yr
Number of lots bordering Broad Beach	121
Number of residences bordering Broad Beach	109
Number of residences located landward of existing revetment	76
Number of Lateral Access Easements (LAEs) on Broad Beach that provide lateral (parallel to shore) public access	51
Number of vertical public access ways (from street to Broad Beach)	2
Existing Temporary Emergency Rock Revetment Data	
Number of acres of beach covered by revetment	~3.02 acres
Length	4,100 feet
Width	22-38 feet
Height (average above MLLW where revetment exists)	12-15 feet
Volume of boulders used to build revetment ¹	36,000 tons
Acres of public trust lands under CSLC jurisdiction covered by revetment ²	0.86 acre
Acres of LAEs covered or impacted by revetment ²	0.73-1.04 acre
Estimated Project Size and Acreage	
Total area of beach and sand dunes proposed for restoration	46 acres
Total volume of sand: initial restoration work	600,000 cy
Total volume of sand: supplementary renourishment (after ~10 years)	450,000 cy
Volume of sand periodically backpassed per annual event	25,000-35,000 cy
Width of restored dry sandy post-construction beach	85-230 feet
Width of restored post-construction sand dune	40-60 feet
Height of restored post-construction sand dune	17-22 feet
Area required for staging: Zuma Beach Parking Lot	1.4-1.9 acres
Area required for sand stockpile: Zuma Beach (along 1,000 feet of beach)	5 acres
Estimated Project Timing (Beach Nourishment and Dune Construction Elements)	
Project life (after initial restoration and supplementary renourishment)	20+/- years
Interval between initial restoration and supplementary renourishment	10+/- years
Project duration	8 months (total)
• Beach nourishment and dune construction	6 months
• Sand movement and placement into proposed location/dimensions	1 month
• Planting, fencing, signage, and irrigation placement in dune systems	1 month
Construction Staging and Sand Transport Information: Initial Nourishment Project	
Duration of hauling of inland quarry material to Broad Beach	5 months
Number of truck trips required between inland quarries and Broad Beach, estimating 840 trips (420 inbound and 420 outbound) per day	43,000
Distance between quarry sand sources and Project site:over land	20-25 miles
Distance between quarry sand sources and Project site:by road	40-45 miles

Abbreviations used: cy = cubic yards; MLLW = Mean Lower Low Water; yr = year.

¹ Larger (> 2-ton) boulders are located at the revetment's west end (due to increased erosion hazard).

² Based on Mean High Tide Line (MHTL) survey conducted in January 2010.

- 1 • Permitting of the as-built sand bag and geotextile revetments that were either
2 unpermitted or installed under emergency conditions in 2008-2009 and used as
3 temporary shoreline protection devices (many of which are now wholly or partially
4 buried under rock revetment) for a 20-year period;
- 5 • Removal of exposed sand bags and Sakrete debris from the beach prior to
6 nourishment, as well as existing informal unpermitted stairways that cross the
7 rock revetment from various private residences to the beach;
- 8 • Import of approximately 600,000 cy of sand that would be trucked along 40 to 45
9 miles of roads from the Simi Valley region in Ventura County (northwest of the
10 Project area) to Zuma Beach Parking Lot 12 via approximately 43,000 heavy
11 haul truck trips (trucking of sand to Zuma Beach would be conducted in
12 accordance with a Transportation Management Plan that identifies the maximum
13 or average number of trucks allowable per day, and their allowable routes,
14 schedule, speed restrictions, and duration);
- 15 • Deposition of delivered sand within a 1.4- to 1.9-acre staging area on Zuma
16 Beach that fronts the western 1,000 feet of the western Zuma Beach parking lots;
- 17 • Use of heavy equipment (e.g., scrapers, large 40-ton/30-cy capacity off-road
18 trucks, and bulldozers) to distribute sand to desired locations and depths,
19 including covering the existing rock and sand bag revetments and creating a
20 restored sandy beach and dune system;
- 21 • Deposition of sand to a depth of roughly 12 to 17 feet in areas seaward of the
22 revetment to create an initial post-construction dry sandy beach of 85 to 230 feet
23 wide seaward of the dunes;
- 24 • Development, construction, and maintenance of a system of sand dunes roughly
25 40 to 60 feet in width and 17 to 22 feet in height, with restored native southern
26 foredune habitat, crossed by 112 access pathways from 109 private residences,
27 the beach club, and two public access points;
- 28 • Removal of non-native vegetation from dune areas and planting of native
29 vegetation with the created sand dunes consistent with applicable CCC and city
30 of Malibu standards for dune habitat restoration areas;
- 31 • Ongoing monitoring of Project performance, including beach width
32 measurements, changes in local or regional sediment supply, general effects on
33 beaches down coast, establishment of dune vegetation, and performance of the
34 revetment (if exposed);
- 35 • Maintenance of beach width using heavy-duty scrapers and other equipment to
36 backpass sand from the wider eastern downdrift reach of Broad Beach to
37 narrower updrift areas to the west, in accordance with objective guidelines, to
38 occur annually as needed;

- 1 • Ongoing coordination with the CSLC and CCC regarding monitoring results and
2 required actions, such as potential for more frequent backpassing and future
3 major renourishment;
- 4 • One major beach renourishment event with approximately 450,000 cy of sand
5 occurring approximately 10 years after completion of initial nourishment.
6 Renourishment would begin in accordance with objective triggers based on
7 monitoring of beach erosion and width; and
- 8 • Receipt of permits to allow installation of up to 550 feet of emergency sand bag
9 or geotextile revetments at Broad Beach's east end and in the 100-foot gap in the
10 revetment.

11 After every backpassing or major beach nourishment event, the constructed beach
12 would remain subject to ongoing natural wave and littoral transport processes and
13 resulting redistribution of sand. As a result, initially constructed beach profiles would
14 evolve and change until the constructed beach reaches a natural equilibrium consistent
15 with ongoing coastal processes.

16 Sand Sources

17 The Project would include the initial deposition of 600,000 cy of sand on Broad Beach.
18 This sand would be excavated from one or more of three privately owned quarries
19 located inland in Ventura County—CEMEX, Grimes Rock, and P.W. Gillibrand—and
20 trucked to Broad Beach. These quarries are located in the Moorpark/Simi area of Simi
21 Valley and are approximately 40 to 45 miles away from Broad Beach. The full quantity
22 of sand required for initial Project beach nourishment (i.e., 600,000 cy) is available from
23 CEMEX and Grimes Rock quarries. The P.W. Gillibrand Quarry can supplement the
24 Project if the other quarries cannot meet the capacity needed to serve the Project. All
25 three quarries and associated trucking operations are fully permitted by Ventura County.

26 Beach and Dune Design and Dune Habitat Restoration

27 Of the 600,000 cy of sand proposed for deposition onto Broad Beach, approximately
28 500,000 cy would be used to construct the beach while the remaining 100,000 cy would
29 be used to construct the dune system. The total area of new dunes, beach berm, and
30 beach face would cover up to 46 acres, 40.5 acres of which would be located on public
31 trust lands administered by the CSLC while the remaining 5.5 acres would be located
32 on private land. The new post-construction dry sand beach berm is projected to extend
33 seaward of the dunes by 90 to 230 feet, with the beach narrower at the west end and
34 wider in the central and eastern sections.⁵ Beach widths in Lechuza Cove would be as
35 narrow as 90 feet while the entire area east of 31330 Broad Beach Road would be at
36 least 200 feet wide. The profile of the new dry sand beach berm would be roughly 12

⁵ Beach widths and sand depth assume the MHTL is at an elevation of 5 feet above MLLW.

1 feet above MLLW in most areas, while the beach profile at the west end (i.e., west of
2 31412 Broad Beach Road) would be between 14 and 17 feet above MLLW.

3 The dune system would be roughly 50 feet wide along most of Broad Beach. The dunes
4 would rise up to 17 to 22 feet above MLLW, depending on location. The height of the
5 proposed sand dunes would be typical of the existing dunes at the east end of the
6 Project, which are approximately 20 feet higher than MLLW, which is the average low
7 tide line during spring tides. The top of the existing emergency rock revetment would be
8 buried beneath a minimum of 2 feet of sand. The dune system would be primarily
9 constructed over and behind the existing emergency rock revetment. At the east end
10 where no revetment is present, the dunes would be constructed on private land and
11 LAEs landward of the MHTL. At the west end where there is no revetment, the dunes
12 would be located primarily on public trust lands, since no dry sand beach remains along
13 this section. As proposed, the Project includes roughly one footpath across the
14 constructed dune system for each property along Broad Beach (approximately 109
15 private paths or approximately every 35 feet), one path adjacent to the Malibu West
16 Beach Club, and two trails provided to incorporate existing public access points.

17 The Project would include measures to restore native coastal dune habitats through
18 planting of appropriate native species typical of southern foredune and southern coastal
19 scrub plant communities. Native habitat restoration would include planting species such
20 as beach verbenas, dune primrose, and other characteristic species found in this
21 community. To increase foredune stability, targets for plant cover would be set between
22 30 and 60 percent, with most dunes achieving 40 percent cover. As proposed, the
23 Applicant would assume responsibility for the construction, planting, and maintenance
24 of the restored dune system (BBGHAD Resolution No. 2012/06). Signs would be posted
25 to demarcate sensitive dune habitats (e.g., "Habitat Area: Please Remain Seaward of
26 Dunes on Sandy Beach"), and no public access would be permitted on the dunes.
27 Further, protocols would be implemented for long-term maintenance of restored
28 habitats, including initial irrigation plans, ongoing invasive species/weed control and
29 maintenance of signs and access control measures.

30 Future Beach Management Events

31 Future beach management events include backpassing, expected to occur annually,
32 and a single renourishment event. The timing of these events would be determined
33 based on the performance of the initial nourishment project and the effect of coastal
34 erosion on sand loss at the beach, as measured by the Applicant's engineers via long-
35 term beach profile monitoring. The goal of this monitoring would be to identify the need
36 to initiate backpassing or a major renourishment episode to offset coastal erosion, and
37 the results of the monitoring program would be used to determine when conditions
38 would trigger the need for a beach management event.

Backpassing. During backpassing, heavy equipment (i.e., scrapers, bulldozers) would excavate sand from the downdrift “sand rich” end of Broad Beach and transport the sand back to the eroding updrift end of Broad Beach (anticipated to be the eastern and western reaches, respectively). The BBGHAD anticipates that backpassing would extend the practical lifetime of this beach nourishment project by recycling sand back within the littoral cell, thereby delaying the need for major beach renourishment, and it proposes to backpass annually, in between nourishment events, for the Project life. Each backpassing event would occur over up to 3 weeks and would involve moving approximately 25,000 to 35,000 cy of sand from the eastern reaches of Broad Beach to the western reaches by Lechuza Point. This would “replace” or move back up coast a portion of the 35,000 to 45,000 cy of sand estimated to be lost from Broad Beach each year. Annual backpassing activities, including borrow area, available volume, extent of backpassing area, and depth of sandy beach cut, would vary depending on the availability of sand and the location of the backpassing borrow and deposition areas.

Renourishment. Given that the current sand loss rate in the Broad Beach area averages 35,000 to 45,000 cy per year, the Project includes one renourishment event. Based on available information at this time, this is anticipated to involve placement of an additional 450,000 cy in approximately 10 years, similar to the original nourishment event. This would be smaller than the initial nourishment event as it is presumed that the 100,000 cy of sand in the new dune system would remain intact, and a certain amount of sand would remain on the beach. The actual timing for when renourishment would occur is unknown and would be determined via monitoring; however, the Applicant’s proposal provides that at least 10 years have passed since the initial nourishment event.

ALTERNATIVES TO THE PROJECT

The Revised APTR also analyzes a range of potential alternatives to the Project with the goal of avoiding or minimizing adverse effects to public trust resources while meeting basic Project objectives. Alternatives to the Project include changes in the location, type and design of coastal protection structure (e.g., relocated or reinforced revetment, seawall construction); removal or shortening of the revetment; and differing approaches to the extent and frequency of beach nourishment and dune construction. Each of these alternatives are analyzed for potential adverse effects on public trust resources, and then compared to the adverse effects associated with the Project. The nine alternatives that are analyzed in this document include:

Alternative 1	Relocation of Improved Revetment Landward of January 2010 Mean High Tide Line (MHTL) with Beach Nourishment and Dune Restoration
Alternative 2	Relocation of Improved Revetment Landward of Lateral Access Easements with Beach Nourishment and Dune Restoration
Alternative 3	Maximum Pull-back of Seawall with Beach Nourishment and Dune Restoration

Alternative 4	Reduced Beach Nourishment Volume and Dune Restoration with Revetment in Current Location
Alternative 5	Beach Nourishment and Dune Restoration with No Shore Protection Structure
Alternative 6	Relocation of Improved Revetment along Upgraded Leach Fields with Beach Nourishment and Dune Restoration
Alternative 7	Removal of Existing Emergency Revetment on the Eastern End of Broad Beach with Beach Nourishment and Restoration
Alternative 8	No Beach Nourishment at West Broad Beach with Revetment at Current Location
Alternative 9	Reduced and Phased Beach Nourishment at West Broad Beach with Existing Revetment

These alternatives are intended to providing a range of options that would feasibly attain most of the basic objectives of the Project, thereby allowing the CLSC, other decision-makers, and interested parties to weigh the benefits with potential adverse effects for each of the alternatives while making a determination about Project approval.

UNRESOLVED ISSUES OR KNOWN AREAS OF POTENTIAL CONTROVERSY

Direct burial impacts to rocky intertidal and subtidal marine habitats at the west end of Broad Beach is of great concern to numerous agencies, particularly as this area lies within and adjacent to the Point Dume SMCA and Point Dume SMR (see Figure ES-2). Although access to these MPAs during the Project would remain open for scuba diving, boating and other recreational activities, the take of all living marine resources within this area is prohibited.⁶ This area is described as “rare and vitally important habitat” and was one of the MLPA Science Advisory Teams top preservation priorities. Additional potential issues of public concern or controversy are identified below.

- Location of the fluctuating MHTL; and the location of the Ordinary High Water Mark (OHWM) being the natural MHTL, prior to fill or artificial accretions, and the fixed boundary between public trust lands and private uplands;
- Approval of a lease for the existing, but not previously CSLC-authorized emergency rock revetment;
- Public lateral and vertical access and potential encroachments and restrictions on such access;
- Potential impacts to Trancas Creek Lagoon, sensitive sand dune species, and Environmentally Sensitive Habitat Areas (ESHAs);
- Lack of a comprehensive dune restoration plan with a feasible schedule and reasonably attainable success criteria;

⁶ Take pursuant to beach nourishment and other sediment management activities is allowed inside the SMCA pursuant to any required federal, state and local permits, or as otherwise authorized by the CDFW (see https://www.dfg.ca.gov/marine/mpa/scmpas_list.asp, under Point Dume SMCA, accessed July 2014).

- Continued use of Onsite Wastewater Treatment Systems (OWTS) for treatment and disposal of septic effluent in the dunes landward of Broad Beach, instead of transitioning to sewage treatment through a wastewater treatment plant; and
- Trucking of sand from quarries via 43,000 truck trips for the initial nourishment and 32,000 truck trips for the renourishment.

Several issues and details remain unresolved in the Applicant's Project. Review of historic sand loss rates at Broad Beach indicate that the initial nourishment event, not considering backpassing, would result in retention of a relatively wide beach for 8 to 10 years after Project completion. However, computer modeling of sand loss conducted for the Project indicates that the beach could narrow to present conditions, at least at the west end, within 3 years. This unknown erosion rate makes it difficult to predict exactly how much time would pass before the beach exhibits the physical triggers indicating the need for follow-up nourishment. The BBGHAD has committed to one renourishment, and if the beach were to erode at the highest projected rate, the effective lifespan of the restored beach could be only 6 years (i.e., 3 years after initial nourishment plus 3 years after renourishment). In contrast, if historic rates of erosion occur the renourished beach could endure for 10 to 20 or more years. When considering that backpassing may prolong beach life by roughly an additional 6 to 8 years, the total Project life could extend up to approximately 22 to 28 years under this scenario.

A long-term commitment for maintenance of funding for the Project is also unidentified at this time. The BBGHAD has committed to the initial nourishment event, one major renourishment event, annual or biannual backpassing of sand, and sand dune habitat maintenance. However, natural processes would continue to affect the beach, with the beach and dunes predicted to erode within a rough time frame of 10 to 20 years. While the BBGHAD has indicated that additional nourishment *may* occur in the future, no firm commitment yet exists beyond the BBGHAD's initial commitment for one additional nourishment event 10 years after the initial beach renourishment.

Large-scale dune restoration as proposed for the Project is a complex process; in order to succeed, it requires expertise, funding, and ongoing maintenance, including weed removal and remedial planting, long after the initial restoration activities. The success of the proposed dune restoration may also be adversely impacted by habitat fragmentation, such as from the creation of multiple private access footpaths within the restored dune habitat area. The Revised APTR includes a measure to prepare a conceptual dune restoration plan subject to review and approval by CSLC, CCC, CDFW, and city of Malibu. The Plan would outline the goals and objectives of dune restoration, identify the minimum requirements and scope for dune restoration activities, and include provisions for private beach access with walkways spaced not less than 300 feet apart (approximately every six houses) to facilitate the joint goals of continued beach access and the creation of a viable and sustained restored dune system.

Table ES-2. Summary of Environmental Impacts for the Project

Impact Class: Mj = Major adverse effect that would remain major and adverse even with the application of Avoidance and Minimization Measures (AMMs)
 Mi = Minor adverse effect with implementation of AMMs
 B = Beneficial impact
 N = Negligible effect
 ↑I = No effect on public trust resources and values; however, increase in intensity of use or effect associated with a specific issue area

Impact	Impact Class	Recommended AMMs (see Section 5.0, Monitoring Implementation Program)
Section 3.1 Coastal Processes, Sea Level Rise, and Geological Resources		
Impact CP/GEO-1: Structural Stability of the Rock and proposed Sand Bag Revetments The rock revetment is subject to remobilization of boulders along with settling from liquefaction events, and proposed sand bags are subject to collapse, reducing long-term protection of onsite wastewater treatment systems (OWTS) from sea level rise (SLR), and wave action.	Mj	AMM TBIO-1a: Implementation of a Comprehensive Dune Restoration Plan
Impact CP/GEO-2: Impact of Coastal Processes on Emergency and Sand Bag Revetments Over the long-term, after cessation of nourishment and erosion of the beach, substandard construction of the revetment would provide inadequate protection from coastal processes for septic systems, leach fields and homes.	Mj	AMM TBIO-1a: Implementation of a Comprehensive Dune Restoration Plan
Impact CP/GEO-3: Protection of Public Trust Resources, Septic Systems, and Homes from Coastal Processes and Shoreline Erosion Beach nourishment and dune creation would provide short- to mid-term beneficial effect (10 to 20+ years) through protection of public trust resources and private property from coastal erosion.	B	No AMMs recommended
Impact CP/GEO-4: Sand Size and Angularity Compatibility of Inland Sand Sources with Existing Sand on Broad Beach Quarry sand being used as beach fill on Broad Beach is similar to existing sand on Broad Beach in size composition, color, and particle angularity.	N	No AMMs recommended
Impact CP/GEO-5: Impacts of Beach Nourishment and Dune Creation on Coastal Processes Nourishment of the beach would have insignificant effects on wave height, wave direction, tides and currents.	N	No AMMs recommended

Table ES-2. Summary of Environmental Impacts for the Project (continued)

Impact	Impact Class	Recommended AMMs (see Section 5.0, Monitoring Implementation Program)
Impact CP/GEO-6: Impacts of Beach Nourishment and Dune Creation on Wave Run-Up Nourishment of the beach would have beneficial effects on wave run-up.	B	No AMMs recommended
Impact CP/GEO-7: Change in Sediment Transport to Down Coast Beaches Nourishment of Broad Beach will increase down shore sediment transport to Zuma Beach, Westward Beach, Point Dume, and other down coast beaches in the Public Trust Impact Area.	B	No AMMs recommended
Impact CP/GEO-8: Impacts of Sea Level Rise Sea level rise would incrementally contribute to erosion of the proposed new beach over the 10 to 20 year Project life span.	N	No AMMs recommended
Section 3.2 Recreation and Public Access		
Impact REC-1: Initial Project Construction and Renourishment Effects on Coastal Access and Recreation Short-term construction would interfere with recreational use and coastal access on public trust lands.	Mi	AMM REC-1: Public Access during Construction and Renourishment
Impact REC-2: Backpassing Impacts to Recreational Users Backpassing would interfere with recreational use and access on public lands.	Mi	AMM REC-2: Public Access during Backpassing
Impact REC-3: Medium- and Short-Term Effects to Recreational Use Project construction and maintenance of a widened beach and restored dune system would enhance public recreation opportunities through provision of a wide sandy beach berm and increased lateral access.	B	AMM REC-3: Beach Profile Reporting
Impact REC-4: Long-Term Effects to Recreational Use Exposure of the revetment through coastal erosion after cessation of beach nourishment would adversely affect recreational beach use and access by blocking public access to public trust lands and LAEs.	Mi	AMM REC-4a: Requirement of Additional Nourishment AMM REC-4b: Sea Level Rise Effects

Table ES-2. Summary of Environmental Impacts for the Project (continued)

Impact	Impact Class	Recommended AMMs (see Section 5.0, Monitoring Implementation Program)
Section 3.3 Marine Biological Resources		
Impact MB-1: Revetment and Sand Bag Placement Impacts to Sandy Intertidal Habitat and Organisms Installation of sand bag and rock revetments from 2008 to 2010 resulted in loss of intertidal habitat and disturbance and mortality of intertidal species.	Mi	AMM TBIO-3a: Biologist and Biological Monitors for Backpassing Activities AMM TBIO-3b: Avoidance of Sensitive Resource Zones and Vegetation AMM TBIO-3c: Sensitive Biological Resources Report AMM REC-4a: Requirement of Additional Nourishment
Impact MB-2: Sand Placement Impacts to Rocky Intertidal Habitat and Organisms Sand placement from Project construction and one renourishment event would result in direct and indirect burial as well as disturbance of sensitive rocky intertidal habitats within Lechuza Cove.	Mj	AMM MB-2a: Compliance with Existing Laws AMM MB-2b: Multi-Agency Collaboration for Sensitive Marine Habitat Impacts AMM MB-2c: Sand Placement Footprint Limitation
Impact MB-3: Sand Placement Impacts to Sandy Intertidal Habitats and Organisms Sand placement from Project construction and one renourishment event would result in burial and disturbance of sensitive sandy intertidal habitats along Broad Beach.	Mi	AMM MB-3: Monitoring for Grunion AMM MB-5a Backpassing Management Plan
Impact MB-4: Sand Placement Impacts to Subtidal Habitats and Organisms Sand placement from Project construction and one renourishment event would result in burial and disturbance of sensitive subtidal habitats offshore of Broad Beach.	Mj	AMM MB-2a: Compliance with Existing Laws AMM MB 2b: Multi-Agency Collaboration for Sensitive Marine Habitat Impacts
Impact MB-5: Backpassing Impacts to Marine Resources Annual or biannual backpassing would prolong disturbance of both rocky and sandy intertidal habitats impacting intertidal species diversity and abundance.	Mi	AMM MB-5a: Backpassing Management Plan AMM MB-5b: Annual Backpassing Plans AMM MB-5c: Beach Habitat Management Plan AMM MB-3: Monitoring for Grunion
Impact MB-6: Impacts to Marine Resources from Potential Fuel or Oil Release The increased vehicle traffic and equipment use associated with the Project would result in an increased risk of oil or fuel release as a consequence of onshore spillage.	Mi	AMM TBIO-4a: Emergency Action Plan Measures Regarding Protection of Biological Resources

Table ES-2. Summary of Environmental Impacts for the Project (continued)

Impact	Impact Class	Recommended AMMs (see Section 5.0, Monitoring Implementation Program)
Impact MB-7: Sand Placement Impacts to Down Coast Marine Biological Resources The deposition of sand supply on Broad Beach would contribute additional sand sources to down coast intertidal habitat through longshore transport within the Santa Monica Littoral Cell.	N	No AMMs recommended
Impact MB-8: Conflicts with Malibu Local Coastal Program and California Coastal Act Policies Project impacts to ESHAs, relative to public access and use of public trust lands, would potentially conflict with the California Coastal Act policies.	Mj	AMM MB-2b: Multi-Agency Collaboration for Sensitive Marine Habitat Impacts AMM MB-2c: Sand Placement Footprint Limitation AMM MB-3: Monitoring for Grunion AMM MB-5a: Backpassing Management Plan AMM MB-5c: Beach Habitat Management Plan
Section 3.4 Terrestrial Biological Resources		
Impact TBIO-1: Impacts to Terrestrial Biological Resources Resulting from the Installation of Sand Bag and Rock Revetments Past installation of sand bag and rock revetments resulted in direct adverse impacts to dune habitat, considered an environmentally sensitive habitat area (ESHA) under the Malibu Local Coastal Program (LCP), as well as to sensitive species such as the globose dune beetle.	Mj	AMM TBIO-1a: Implementation of a Comprehensive Dune Restoration Plan AMM TBIO-1b: If Applicable, Conform with California Coastal Commission (CCC) Coastal Development Permit for Off-Site Mitigation of ESHA
Impact TBIO-2: Short-Term Project-Generated Construction Impacts to Terrestrial Biological Resources Construction activities associated with proposed beach nourishment and dune creation may adversely impact existing sandy beach and foredune habitats and biological resources, as well as the Trancas Lagoon.	Mj	AMM TBIO-2a: California State Lands Commission (CSLC)-Approved Biologist and Biological Monitors for Construction Activities AMM TBIO-2b: Sensitive Resources Impact Avoidance AMM TBIO-2c: Protect Stockpiles of Excavated Material AMM TBIO-2d: Storage of Materials or Heavy Equipment Prohibited Outside of Staging Area
Impact TBIO-3: Long-term Construction Impacts of Backpassing to Terrestrial Biological Resources Future beach maintenance using backpassing may impact existing environmentally sensitive habitat areas (ESHAs) and/or created sensitive habitat areas, including sandy beach and foredune habitats, as well as Trancas Lagoon.	Mi	AMM TBIO-3a: Biologist and Biological Monitors for Backpassing Activities AMM TBIO-3c: Sensitive Biological Resources Report AMM TBIO-2a: CSLC-Approved Biologist and Biological Monitors for Construction Activities AMM TBIO-2b: Sensitive Resources Impact Avoidance

Table ES-2. Summary of Environmental Impacts for the Project (continued)

Impact	Impact Class	Recommended AMMs (see Section 5.0, Monitoring Implementation Program)
Impact TBIO-4: Hazardous Spill Impacts to Beach, Coastal Dunes, and Coastal Wetland Biological Resources An accidental hazardous spill and subsequent cleanup efforts would potentially result in take of special-status species, the loss or degradation of functional habitat values, or cause a substantial loss of a population or habitat of native fish, wildlife, or vegetation.	Mj	AMM TBIO-4a: Emergency Action Plan Measures Regarding Protection of Biological Resources AMM TBIO-4b: Maintain Equipment and Adhere to Work Plan
Impact TBIO-5: Longshore Sand Transport and Down Coast Impacts to Terrestrial Biological Resources Nourishment of Broad Beach with 600,000 cubic yards of beach sand would increase sand supply available for longshore transport down coast, potentially altering the hydrology of the Trancas Lagoon and the Zuma Wetlands ESHAs by widening the beach berm, but also increasing sand supply to beach and dune habitats down coast.	Mi	AMM TBIO-5a: Maintain the Hydrology of Trancas Lagoon AMM TBIO-5b: Coordination of Backpassing and Berm Breaching
Impact TBIO-6: Impacts to Terrestrial Biological Resources Resulting From Dune Restoration The proposed dune restoration would result in potential short- to mid-term beneficial effects through enhancement of dune habitat values, as well as potentially increase populations of special-status wildlife or plant species.	B	No AMMs recommended
Impact TBIO-7: Impacts to Terrestrial Biological Resources Resulting from Increased Private and Public Access The proposed beach nourishment, including the dune habitat restoration, would occur adjacent to existing private residences. Private and public access ways to Broad Beach would interrupt the continuity of undisturbed dune habitat and may ultimately decrease the functional value of the restored dune system or result in an increase in incidental take, disturbance, and/or harassment of sensitive species.	Mi	AMM TBIO-7: Restrict Access Across the Newly Restored Dune System AMM TBIO-1a: Implementation of a Comprehensive Dune Restoration Plan
Impact TBIO-8: Long-term Degradation and Erosion of Newly Created Dune Habitat Following cessation of the additional renourishment event and backpassing, newly restored dune habitat would gradually erode, eventually exposing the revetment and likely leading to a return to emergency measures for protection of property not protected by the revetment or impacted by the degradation of the revetment.	Mi	AMM TBIO-1a: Implementation of a Comprehensive Dune Restoration Plan AMM TBIO-7: Restrict Access Across the Newly Restored Dune System AMM REC-5a: Requirement of Additional Nourishment

Table ES-2. Summary of Environmental Impacts for the Project (continued)

Impact	Impact Class	Recommended AMMs (see Section 5.0, Monitoring Implementation Program)
Section 3.5 Marine Water Quality		
Impact MWQ-1: Project Implementation Impacts due to Turbidity or Other Impairment of Area Waters Project construction and nourishment/renourishment activities may increase turbidity in, or result in a violation of other water quality standards for, nearshore waters.	Mi	AMM MWQ-1a: Prepare and Implement Turbidity Monitoring Plan AMM MWQ-1b: Prepare Pollution Prevention Plan and Implement Best Management Practices (BMPs) AMM MB-2a: Sand Placement Footprint Limitation AMM HAZ-2a: Develop Hazardous Material Spill Prevention Control and Countermeasure Plan
Impact MWQ-2: Beach Nourishment and Backpassing Impacts to Trancas Lagoon Beach nourishment and construction activities would occur near the mouth of Trancas Creek potentially affecting tidal exchange and the natural functioning of Trancas Lagoon.	Mi	AMM MWQ-2a: Construction Limitations AMM TBIO-5a: Maintain the Hydrology of Trancas Creek Lagoon
Impact MWQ-3: Revetment Retention Impacts Associated with Nutrient Loading of Area Waters Retention of the revetment would protect Onsite Wastewater Treatment Systems (OWTSS) from wave action and reduce or eliminate contact between marine water and untreated sewage effluent.	B	No AMMs recommended
Impact MWQ-4: Beach Sand Contaminant Resuspension and New Sand Chemical Compatibility Initial and Follow-up Nourishment Events, including annual backpassing, would suspend or resuspend contaminants, particularly if onshore quarry sand sources contain contaminants.	N	No AMMs recommended
Section 3.6 Scenic Resources		
Impact SR-1: Visual Effects from the Presence of the Emergency Revetment The emergency revetment impacts the visual quality of Broad Beach.	Mi	AMM TBIO-1a: Implementation of a Comprehensive Dune Restoration Plan AMM REC-4a: Requirement of Additional Nourishment AMM REC-4b: Requirement to Analyze Sea Level Rise Effects

Table ES-2. Summary of Environmental Impacts for the Project (continued)

Impact	Impact Class	Recommended AMMs (see Section 5.0, Monitoring Implementation Program)
Impact SR-2: Short-Term Visual Effects from Beach Restoration Construction Activities at Broad Beach and Zuma Beach Construction activities would create temporary negative visual impacts during dune restoration, nourishment events, and backpassing events.	Mi	AMM SR-2a: Shielded Lights during Night Operations AMM SR-2b: Nightly Equipment Removal
Impact SR-3: Visual Effects from the Nourishment of Broad Beach Nourishment of Broad Beach would improve the visual quality of Broad Beach over the short- to mid-term.	B	No AMMs recommended
Impact SR-4: Visual Effects from 43,000 Truck Trips along Pacific Coast Highway Transport activities could create temporary negative visual impacts associated with a high volume of large trucks traversing Pacific Coast Highway during the initial construction phase.	N	No AMMs recommended
Impact SR-5: Visual Effects from the Addition of Sand to the Local Littoral Cell Nourishment of Broad Beach would add sand to the Santa Monica Littoral Cell, which would increase the sand budget of several other beaches down the coast, thus potentially improving their visual qualities.	B	No AMMs recommended
Section 3.7.1 Air Quality		
Impact AQ-1: Construction and Transportation Impacts on Air Quality Construction activities would generate emissions that exceed South Coast Air Quality Management District thresholds, while emissions from Haul Trucks would exceed Ventura County Air Pollution Control District thresholds.	Mj	AMM AQ-1a: South Coast Air Quality Management District (SCAQMD) Compliance AMM AQ-1b: Ventura County Air Pollution Control District (VCAPCD) Compliance AMM AQ-1c: Nitrogen Oxides (NO _x), Volatile Organic Compounds (VOCs), and Particulate Matter (PM) Control AMM AQ-1d: Fugitive Dust Emission Control
Impact AQ-2: Construction Impact of Greenhouse Gas (GHG) Emissions Potential beach enhancement activities would increase GHG emissions.	N	No AMMs recommended
Impact AQ-3: Construction Toxic Pollutant Emissions and Potential Health Risks Construction activities would generate emissions of toxic air contaminants that would potentially impact human health.	Mi	AMM AQ-3: Diesel Particulate Emission Controls AMM AQ-1c: NO _x /VOC/PM Emission Controls AMM AQ-1d: Fugitive Dust Emission Controls

Table ES-2. Summary of Environmental Impacts for the Project (continued)

Impact	Impact Class	Recommended AMMs (see Section 5.0, Monitoring Implementation Program)
Section 3.7.2 Traffic and Parking		
Impact TR-1: Construction-Generated Impacts in the Vicinity of Broad Beach Traffic along Pacific Coast Highway generated from construction activities would have a short-term, unsubstantial impact on public use of roadways to access the shoreline.	Mi	AMM TR-1: Traffic Management Plan
Impact TR-2: Increased Parking Demand along Broad Beach Road A wider dry sandy beach at Broad Beach following renourishment may attract more users which would increase parking demand on Broad Beach Road.	N	No AMMs recommended
Impact TR-3: Increased Safety Risk in the Vicinity of Broad Beach 43,000 truck trips along the Pacific Coast Highway portion of the sand transportation routes to the Project site would create an increased traffic safety risk.	Mi	AMM TR-1: Traffic Management Plan
Impact TR-4: Impacts of Inland Truck Hauling Routes from the Inland Quarries to Pacific Coast Highway Traffic generated from construction activities would have a short-term, negligible impact on public use of roadways to access the shoreline.	I	AMM TR-1: Traffic Management Plan
Section 3.7.3 Cultural and Paleontological Resources		
Impact CR-1: Disturbance of a Significant Cultural or Significant Paleontological Resource due to Construction of the Emergency Revetment. Construction of the emergency revetment may have disturbed cultural or paleontological resources or their surroundings on Broad Beach.	N	No AMMs recommended
Impact CR-2: Disturbance of a Significant Cultural or Significant Paleontological Resource or its Surroundings due to Beach Nourishment Beach nourishment activities may disturb cultural or paleontological resources or their surroundings in the Broad Beach Restoration area.	N	No AMMs recommended
Impact CR-3: Disturbance of a Significant Cultural Resource along Sand Transportation Routes Hauling activities may disturb cultural resources in the BBGHAD Inland Project Area.	N	No AMMs recommended

Table ES-2. Summary of Environmental Impacts for the Project (continued)

Impact	Impact Class	Recommended AMMs (see Section 5.0, Monitoring Implementation Program)
Section 3.7.4 Noise		
Impact N-1: Construction Impacts to Recreational Users of Broad Beach Short-term noise levels would increase during Project construction potentially affecting a public beach.	Mi	AMM N-1a: Use of Noise-Attenuating Devices on Construction Equipment AMM N-1b: City of Malibu Approval for Exceedance of City Noise Ordinance
Impact N-2: Construction and Operational Impact to Sensitive Receptors along Pacific Coast Highway (PCH) Short-term highway noise levels would increase during sand hauling, potentially affecting visitor-serving uses and residents along PCH.	Mj	AMM N-1a: Use of Noise-Attenuating Devices on Construction Equipment AMM N-1b: City of Malibu Approval for Exceedance of City Noise Ordinance
Impact N-3: Construction and Operational Impact to Sensitive Receptors along BBGHAD Inland Project Area Short-term highway noise levels would increase during sand hauling, potentially affecting visitor-serving uses and residents along roadways within BBGHAD Inland Project Area.	I	AMM N-1a: Use of Noise-Attenuating Devices on Construction Equipment
Section 3.11 Public Health and Safety, Hazards		
Impact HAZ-1: Authorization of the Revetment Creates Hazards Authorization of the emergency revetment could impact public health and safety by trapping beach users between large rocks and incoming surf and tides.	Mi	AMM TBIO-1a: Implementation of a Comprehensive Dune Restoration Plan AMM REC-4a: Requirement of Additional Nourishment
Impact HAZ-2: Hazardous Materials Release During Construction Hazardous material released from construction equipment on the beach during two nourishment events and backpassing could impact public safety.	Mi	AMM HAZ-2: Develop Hazardous Material Spill Prevention Control and Countermeasure Plan (SPCCP)
Impact HAZ-3: Hazardous Conditions During Construction at Broad Beach Construction activities at Broad Beach during nourishment and backpassing events could impact the safety of public beach users.	Mi	AMM HAZ-3a: Demarcation of Public Access Routes AMM HAZ-3b: Provision of Contact for Reporting Hazards
Impact HAZ-4: Potential for Sediment Placed on Broad Beach to be Contaminated Sediment material introduced to Broad Beach could impact public health and safety due to the chemical content of the new material.	Mi	AMM HAZ-4a: Response to Sediment Contamination

Table ES-2. Summary of Environmental Impacts for the Project (continued)

Impact	Impact Class	Recommended AMMs (see Section 5.0, Monitoring Implementation Program)
Impact HAZ-5: Burial of the Emergency Revetment Burial of the emergency revetment could have short- to mid-term benefits to public health and safety.	B	No AMMs recommended
Section 3.7.6 Utilities and Service Systems		
Impact UTL-1: Project Increases Protection of Seaside Broad Beach OWTS Authorization of the emergency revetment, proposed supplemental sand bag installation, as needed, and creation of a wide sandy beach and new dune system would protect existing leach and drain fields from damage by wave action over the mid-term, preventing potential water pollution.	B	No AMMs recommended
Impact UTL-2: Long-Term Exposure of OWTS to Coastal Erosion Limited nourishment events and granting permanence to substandard revetment construction would expose OWTS to damage from wave and tidal action over the long-term (e.g., 20+ years).	Mj	AMM TBIO-1a: Implementation of a Comprehensive Dune Restoration Plan
Impact UTL-3: Effects on Existing Public Drainage Systems Construction of the revetment covered existing exposed public drainage pipes, and construction of the restored dunes and beach nourishment would potentially further bury or obstruct storm drains.	Mi	AMM UTL-3: Master Drainage Plan (MDP)
Section 3.7.7 Environmental Justice		
Impact EJ-1: Disproportionate Adverse Impacts to Minority and/or Low-income Populations due to the Emergency Revetment The presence of the emergency revetment impacts public access, and has the potential to disproportionately affect minority and/or low-income populations.	N	No AMMs recommended
Impact EJ-2: Potential for Disproportionate Adverse Impacts to Minority and/or Low-income Populations due to Beach Nourishment at Broad Beach Beach nourishment activities would not have impacts that could disproportionately affect minority and/or low-income populations in the Project area.	N	No AMMs recommended
Impact EJ-3: Disproportionate Decrease in the Employment and Economic Base of Minority and/or Low-income Populations Residing in the County and/or Immediately Surrounding Cities Beach nourishment activities would not decrease the employment or economic base of minority and/or low-income populations.	N	No AMMs recommended

Table ES-2. Summary of Environmental Impacts for the Project (continued)

Impact	Impact Class	Recommended AMMs (see Section 5.0, Monitoring Implementation Program)
Impact EJ-4: Increased Area of Accessible Public Trust Lands Beach nourishment activities would increase the access to and enjoyment of public trust lands on Broad Beach.	B	No AMMs recommended
Impact EJ-5: Disproportionate Adverse Impacts to Minority and/or Low-income Populations due to the Transportation of Inland Sand to Broad Beach. Transportation activities may have impacts that could disproportionately affect minority and/or low-income populations in the BBGHAD Inland Project Area.	I	AMM N-1a: Use of Noise-Attenuating Devices on Construction Equipment

Table ES-3. Summary of Environmental Impacts for Project and Alternatives

Impact Class: Mj = Major adverse effect that would remain major and adverse even with the application of AMMs

Mi = Minor adverse effect with implementation of AMMs

B = Beneficial impact

N = Negligible effect

↑I = No effect on public trust resources and values; however, increase in intensity of use or effect associated with a specific issue area

Alternative Key:

Alternative 1 = Relocation of Improved Revetment Landward of January 2010 MHTL with Beach Nourishment and Dune Restoration

Alternative 2 = Relocation of Improved Revetment Landward of Lateral Access Easements with Beach Nourishment and Dune Restoration

Alternative 3 = Maximum Pull-back of Seawall with Beach Nourishment and Dune Restoration

Alternative 4 = Reduced Beach Nourishment Volume and Dune Restoration with Revetment in Current Location

Alternative 5 = Beach Nourishment and Dune Restoration with No Shore Protection Structure

Alternative 6 = Relocation of Improved Revetment along Upgraded Leach Fields with Beach Nourishment and Dune Restoration

Alternative 7 = Removal of Existing Emergency Revetment on the Eastern End of Broad Beach with Beach Nourishment and Restoration

Alternative 8 = No Beach Nourishment at West Broad Beach with Revetment at Current Location

Alternative 9 = Reduced and Phased Beach Nourishment at West Broad Beach with Existing Revetment

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
Section 3.1 Coastal Processes, Sea Level Rise, and Geological Resources										
Impact CP/GEO-1: Structural Stability of the Rock and proposed Sand Bag Revetments The rock revetment is subject to remobilization of boulders along with settling from liquefaction events, and proposed sand bags are subject to collapse, reducing long-term protection of onsite wastewater treatment systems (OWTS) from sea level rise (SLR), and wave action.	Mj	Less adverse	Less adverse	Much less adverse	Similar	Much more adverse	Less adverse	More adverse	Similar	Similar

Table ES-3. Summary of Environmental Impacts for Project and Alternatives (continued)

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
Impact CP/GEO-2: Impact of Coastal Processes on Emergency and Sand Bag Revetments Over the long-term, after cessation of nourishment and erosion of the beach, substandard construction of the revetment would provide inadequate protection from coastal processes for septic systems, leach fields and homes.	Mj	Less adverse	Less adverse	Much less adverse	More adverse	Much more adverse	Much less adverse	More adverse	Similar	Similar
Impact CP/GEO-3: Protection of Public Trust Resources, Septic Systems, and Homes from Coastal Processes and Shoreline Erosion Beach nourishment and dune creation would provide short- to mid-term beneficial effect (10 to 20+ years) through protection of public trust resources and private property from coastal erosion.	B	More beneficial	More beneficial	More beneficial	Similar	Less beneficial	More beneficial	Less beneficial	Less beneficial	Less beneficial
Impact CP/GEO-4: Sand Size and Angularity Compatibility of Inland Sand Sources with Existing Sand on Broad Beach Quarry sand being used as beach fill on Broad Beach is similar to existing sand on Broad Beach in size composition, color, and particle angularity.	N	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Impact CP/GEO-5: Impacts of Beach Nourishment and Dune Creation on Coastal Processes Nourishment of the beach would have insignificant effects on wave height, wave direction, tides and currents.	N	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Impact CP/GEO-6: Impacts of Beach Nourishment and Dune Creation on Wave Run-Up	B	Similar	Similar	Similar	Similar	Less beneficial	Similar	Similar	Less beneficial	Slightly less beneficial

Table ES-3. Summary of Environmental Impacts for Project and Alternatives (continued)

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
Nourishment of the beach would have beneficial effects on wave run-up.										
Impact CP/GEO-7: Change in Sediment Transport to Down Coast Beaches Nourishment of Broad Beach will increase down shore sediment transport to Zuma Beach, Westward Beach, Point Dume, and other down coast beaches in the Public Trust Impact Area.	B	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Less beneficial	Less beneficial
Impact CP/GEO-8: Impacts of Sea Level Rise Sea level rise would incrementally contribute to erosion of the proposed new beach over the 10 to 20 year Project life span.	N	Similar	Similar	Similar	Similar	More adverse	Similar	Less adverse	More adverse	More adverse
Section 3.2 Recreation and Public Access										
Impact REC-1: Initial Project Construction and Renourishment Effects on Coastal Access and Recreation Short-term construction would interfere with recreational use and coastal access on public trust lands.	Mi	More adverse	More adverse	More adverse	More adverse	More adverse	More adverse	More adverse	Similar	Similar
Impact REC-2: Backpassing Impacts to Recreational Users Backpassing would interfere with recreational use and access on public lands.	Mi	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Impact REC-3: Medium- and Short-Term Effects to Recreational Use Project construction and maintenance of a widened beach and restored dune system would enhance public recreation opportunities through provision of a wide sandy beach berm	B	Similar	Similar	Similar	More beneficial	More beneficial	Less beneficial	More beneficial	Less beneficial	Less beneficial

Table ES-3. Summary of Environmental Impacts for Project and Alternatives (continued)

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
and increased lateral access.										
Impact REC-4: Long-Term Effects to Recreational Use Exposure of the revetment though coastal erosion after cessation of beach nourishment would adversely affect recreational beach use and access by blocking public access to public trust lands and LAEs.	Mi	Less adverse	Less adverse	Less adverse	Similar	Less adverse	More adverse	Less adverse	Similar	Similar
Section 3.3 Marine Biological Resources										
Impact MB-1: Revetment and Sand Bag Placement Impacts to Sandy Intertidal Habitat and Organisms Installation of sand bag and rock revetments from 2008 to 2010 resulted in loss of intertidal habitat and disturbance and mortality of intertidal species.	Mi	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Impact MB-2: Sand Placement Impacts to Rocky Intertidal Habitat and Organisms Sand placement from Project construction and one renourishment event would result in direct and indirect burial as well as disturbance of sensitive rocky intertidal habitats within Lechuza Cove.	Mj	Similar	Similar	Similar	More adverse	Similar	Similar	Similar	Much less adverse	Much less adverse
Impact MB-3: Sand Placement Impacts to Sandy Intertidal Habitats and Organisms Sand placement from Project construction and one renourishment event would result in burial and disturbance of sensitive sandy intertidal habitats along Broad Beach.	Mi	Similar	Similar	Similar	More adverse	Similar	Similar	Similar	Slightly less adverse	Slightly less adverse
Impact MB-4: Sand Placement Impacts to Subtidal Habitats and	Mj	Similar	Similar	Similar	Slightly less	Similar	Similar	Similar	Less adverse	Less adverse

Table ES-3. Summary of Environmental Impacts for Project and Alternatives (continued)

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
Organisms Sand placement from Project construction and one renourishment event would result in burial and disturbance of sensitive subtidal habitats offshore of Broad Beach.					adverse					
Impact MB-5: Backpassing Impacts to Marine Resources Annual or biannual backpassing would prolong disturbance of both rocky and sandy intertidal habitats impacting intertidal species diversity and abundance.	Mi	Similar	Similar	Similar	Less adverse	Similar	Similar	Similar	Similar	Similar
Impact MB-6: Impacts to Marine Resources from Potential Fuel or Oil Release The increased vehicle traffic and equipment use associated with the Project would result in an increased risk of oil or fuel release as a consequence of onshore spillage.	Mi	Slightly more adverse	Slightly more adverse	Slightly more adverse	More adverse	Slightly more adverse	Slightly more adverse	Slightly more adverse	Slightly less adverse	Slightly less adverse
Impact MB-7: Sand Placement Impacts to Down Coast Marine Biological Resources The deposition of sand supply on Broad Beach would contribute additional sand sources to down coast intertidal habitat through longshore transport within the Santa Monica Littoral Cell.	N	Similar	Similar	Similar	Less adverse	Similar	Similar	Similar	Slightly less adverse	Slightly less adverse
Impact MB-8: Conflicts with Malibu Local Coastal Program and California Coastal Act Policies Project impacts to ESHAs, relative to public access and use of public trust lands, would potentially conflict with the California Coastal Act policies.	Mj	Similar	Similar	Similar	Similar	Similar	More adverse	Similar	Less adverse	Less adverse

Table ES-3. Summary of Environmental Impacts for Project and Alternatives (continued)

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
Section 3.4 Terrestrial Biological Resources										
Impact TBIO-1: Impacts to Terrestrial Biological Resources Resulting from the Installation of Sand Bag and Rock Revetments Past installation of sand bag and rock revetments resulted in direct adverse impacts to dune habitat, considered an environmentally sensitive habitat area (ESHA) under the Malibu Local Coastal Program (LCP), as well as to sensitive species such as the globose dune beetle.	Mj	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Impact TBIO-2: Short-Term Project-Generated Construction Impacts to Terrestrial Biological Resources Construction activities associated with proposed beach nourishment and dune creation may adversely impact existing sandy beach and foredune habitats and biological resources, as well as the Trancas Lagoon.	Mj	More adverse	More adverse	More adverse	Less adverse	More adverse	Much more adverse	More adverse	Similar	Similar
Impact TBIO-3: Long-term Construction Impacts of Backpassing to Terrestrial Biological Resources Future beach maintenance using backpassing may impact existing environmentally sensitive habitat areas (ESHAs) and/or created sensitive habitat areas, including sandy beach and foredune habitats, as well as Trancas Lagoon.	Mi	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Impact TBIO-4: Hazardous Spill Impacts to Beach, Coastal Dunes, and Coastal Wetland Biological Resources An accidental hazardous spill and subsequent cleanup efforts would	Mj	More adverse	More adverse	More adverse	More adverse	More adverse	More adverse	More adverse	Slightly less adverse	Similar

Table ES-3. Summary of Environmental Impacts for Project and Alternatives (continued)

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
potentially result in take of special-status species, the loss or degradation of functional habitat values, or cause a substantial loss of a population or habitat of native fish, wildlife, or vegetation.										
Impact TBIO-5: Longshore Sand Transport and Down Coast Impacts to Terrestrial Biological Resources Nourishment of Broad Beach with 600,000 cubic yards of beach sand would increase sand supply available for longshore transport down coast, potentially altering the hydrology of the Trancas Lagoon and the Zuma Wetlands ESHAs by widening the beach berm, but also increasing sand supply to beach and dune habitats down coast.	Mi	Similar	Similar	Slightly more adverse	Less adverse	Similar	Similar	More adverse	Less adverse	Slightly less adverse
Impact TBIO-6: Impacts to Terrestrial Biological Resources Resulting From Dune Restoration The proposed dune restoration would result in potential short- to mid-term beneficial effects through enhancement of dune habitat values, as well as potentially increase populations of special-status wildlife or plant species.	B	Similar	Similar	More beneficial	Similar	Less beneficial	Less beneficial	More adverse	Less beneficial	Similar
Impact TBIO-7: Impacts to Terrestrial Biological Resources Resulting from Increased Private and Public Access The proposed beach nourishment, including the dune habitat restoration, would occur adjacent to existing private residences. Private and public access ways to Broad Beach would	Mi	Similar	Similar	Similar	Similar	Similar	Less adverse	More adverse	Similar	Similar

Table ES-3. Summary of Environmental Impacts for Project and Alternatives (continued)

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
interrupt the continuity of undisturbed dune habitat and may ultimately decrease the functional value of the restored dune system or result in an increase in incidental take, disturbance, and/or harassment of sensitive species.										
Impact TBIO-8: Long-term Degradation and Erosion of Newly Created Dune Habitat Following cessation of the additional renourishment event and backpassing, newly restored dune habitat would gradually erode, eventually exposing the revetment and likely leading to a return to emergency measures for protection of property not protected by the revetment or impacted by the degradation of the revetment.	Mi	Less adverse	Less adverse	Slightly more adverse	Similar	Much more adverse	Similar	More adverse	Slightly more adverse	Similar
Section 3.5 Marine Water Quality										
Impact MWQ-1: Project Implementation Impacts due to Turbidity or Other Impairment of Area Waters Project construction and nourishment/renourishment activities may increase turbidity in, or result in a violation of other water quality standards for, nearshore waters.	Mi	Similar	Similar	Similar	Similar	More adverse	Similar	Similar	Less adverse	Slightly less adverse
Impact MWQ-2: Beach Nourishment and Backpassing Impacts to Trancas Lagoon Beach nourishment and construction activities would occur near the mouth of Trancas Creek potentially affecting tidal exchange and the natural functioning of Trancas Lagoon.	Mi	Similar	Similar	Similar	Slightly less adverse	Similar	Similar	Slightly more adverse	Less adverse	Slightly less adverse

Table ES-3. Summary of Environmental Impacts for Project and Alternatives (continued)

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
Impact MWQ-3: Revetment Retention Impacts Associated with Nutrient Loading of Area Waters Retention of the revetment would protect Onsite Wastewater Treatment Systems (OWTSs) from wave action and reduce or eliminate contact between marine water and untreated sewage effluent.	B	More beneficial	More beneficial	More beneficial	Similar	Less beneficial	Much more beneficial	Much less beneficial	Less beneficial	Similar
Impact MWQ-4: Beach Sand Contaminant Resuspension and New Sand Chemical Compatibility Initial and Follow-up Nourishment Events, including annual backpassing, would suspend or resuspend contaminants, particularly if onshore quarry sand sources contain contaminants.	N	Similar	Similar	Similar	Similar	Similar	Similar	Slightly more adverse	Similar	Similar
Section 3.6 Scenic Resources										
Impact SR-1: Visual Effects from the Presence of the Emergency Revetment The emergency revetment impacts the visual quality of Broad Beach.	Mi	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Impact SR-2: Short-Term Visual Effects from Beach Restoration Construction Activities at Broad Beach and Zuma Beach Construction activities would create temporary negative visual impacts during dune restoration, nourishment events, and backpassing events.	Mi	Slightly more adverse	Slightly more adverse	Slightly more adverse	More adverse	Slightly more adverse	Slightly more adverse	Slightly more adverse	Slightly less adverse	Similar
Impact SR-3: Visual Effects from the Nourishment of Broad Beach Nourishment of Broad Beach would improve the visual quality of Broad Beach over the short- to mid-term.	B	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Less beneficial	Similar

Table ES-3. Summary of Environmental Impacts for Project and Alternatives (continued)

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
Impact SR-4: Visual Effects from 43,000 Truck Trips along Pacific Coast Highway Transport activities could create temporary negative visual impacts associated with a high volume of large trucks traversing Pacific Coast Highway during the initial construction phase.	N	Slightly more adverse	Slightly more adverse	Slightly more adverse	Slightly more adverse	Slightly more adverse	Slightly more adverse	Similar	Slightly less adverse	Similar
Impact SR-5: Visual Effects from the Addition of Sand to the Local Littoral Cell Nourishment of Broad Beach would add sand to the Santa Monica Littoral Cell, which would increase the sand budget of several other beaches down the coast, thus potentially improving their visual qualities.	B	Similar	Similar	Similar	Slightly less beneficial	Similar	Similar	Similar	Slightly less beneficial	Slightly less beneficial
Section 3.7.1 Air Quality										
Impact AQ-1: Construction and Transportation Impacts on Air Quality Construction activities would generate emissions that exceed South Coast Air Quality Management District thresholds, while emissions from Haul Trucks would exceed Ventura County Air Pollution Control District thresholds.	Mj	More adverse	More adverse	Much more adverse	Similar	Slightly more adverse	More adverse	Slightly more adverse	Less adverse	Less adverse
Impact AQ-2: Construction Impact of Greenhouse Gas (GHG) Emissions Potential beach enhancement activities would increase GHG emissions.	N	Slightly more adverse	More adverse	More adverse	Similar	Slightly more adverse	Slightly more adverse	Slightly more adverse	Less adverse	Slightly less adverse
Impact AQ-3: Construction Toxic Pollutant Emissions and Potential Health Risks Construction activities would generate emissions of toxic air contaminants	Mi	Slightly more adverse	Slightly more adverse	Slightly more adverse	Similar	Slightly more adverse	Slightly more adverse	Slightly more adverse	Slightly less adverse	Similar

Table ES-3. Summary of Environmental Impacts for Project and Alternatives (continued)

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
that would potentially impact human health.										
Section 3.7.2 Traffic and Parking										
Impact TR-1: Construction-Generated Impacts in the Vicinity of Broad Beach Traffic along Pacific Coast Highway generated from construction activities would have a short-term, unsubstantial impact on public use of roadways to access the shoreline.	Mi	Slightly more adverse	Slightly more adverse	More adverse	Slightly less adverse	Slightly more adverse	Slightly more adverse	Slightly more adverse	Less adverse	Slightly less adverse
Impact TR-2: Increased Parking Demand along Broad Beach Road A wider dry sandy beach at Broad Beach following renourishment may attract more users which would increase parking demand on Broad Beach Road.	N	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Impact TR-3: Increased Safety Risk in the Vicinity of Broad Beach 43,000 truck trips along the Pacific Coast Highway portion of the sand transportation routes to the Project site would create an increased traffic safety risk.	Mi	Slightly more adverse	Slightly more adverse	Slightly more adverse	Slightly less adverse	Slightly more adverse	Slightly more adverse	Slightly more adverse	Slightly less adverse	Slightly less adverse
Impact TR-4: Impacts of Inland Truck Hauling Routes from the Inland Quarries to Pacific Coast Highway Traffic generated from construction activities would have a short-term, negligible impact on public use of roadways to access the shoreline.	I	Similar	Slightly more adverse	More adverse	Slightly more adverse	Similar	Similar	Slightly more adverse	Less adverse	Slightly less adverse
Section 3.7.3 Cultural and Paleontological Resources										
Impact CR-1: Disturbance of a Significant Cultural or Significant Paleontological Resource due to Construction of the Emergency Revetment	N	Slightly more adverse	Slightly more adverse	Slightly more adverse	Similar	Slightly More adverse	Slightly More adverse	Slightly More adverse	Similar	Similar

Table ES-3. Summary of Environmental Impacts for Project and Alternatives (continued)

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
Construction of the emergency revetment may have disturbed cultural or paleontological resources or their surroundings on Broad Beach.										
Impact CR-2: Disturbance of a Significant Cultural or Significant Paleontological Resource or its Surroundings due to Beach Nourishment Beach nourishment activities may disturb cultural or paleontological resources or their surroundings in the Broad Beach Restoration area.	N	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Impact CR-3: Disturbance of a Significant Cultural Resource along Sand Transportation Routes Hauling activities may disturb cultural resources in the BBGHAD Inland Project Area.	N	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Section 3.7.4 Noise										
Impact N-1: Construction Impacts to Recreational Users of Broad Beach Short-term noise levels would increase during Project construction potentially affecting a public beach.	Mi	Slightly more adverse	Slightly more adverse	Much more adverse	Slightly more adverse	More adverse	More adverse	More adverse	Slightly less adverse	Similar
Impact N-2: Construction and Operational Impact to Sensitive Receptors along Pacific Coast Highway (PCH) Short-term highway noise levels would increase during sand hauling, potentially affecting visitor-serving uses and residents along PCH.	Mj	Slightly more adverse	Slightly more adverse	More adverse	Slightly more adverse	Slightly more adverse	Slightly more adverse	Slightly more adverse	Slightly less adverse	Similar
Impact N-3: Construction and Operational Impact to Sensitive Receptors along BBGHAD Inland Project Area	I	Similar	Slightly more adverse	More adverse	Slightly more adverse	Similar	Similar	Similar	Less adverse	Slightly less adverse

Table ES-3. Summary of Environmental Impacts for Project and Alternatives (continued)

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
Short-term highway noise levels would increase during sand hauling, potentially affecting visitor-serving uses and residents along roadways within BBGHAD Inland Project Area.										
Section 3.7.5 Public Health and Safety, Hazards										
Impact HAZ-1: Authorization of the Revetment Creates Hazards Authorization of the emergency revetment could impact public health and safety by trapping beach users between large rocks and incoming surf and tides.	Mi	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Impact HAZ-2: Hazardous Materials Release During Construction Hazardous material released from construction equipment on the beach during two nourishment events and backpassing could impact public safety.	Mi	Slightly more adverse	Slightly more adverse	More adverse	Slightly more adverse	More adverse	Slightly more adverse	Slightly more adverse	Slightly less adverse	Slightly less adverse
Impact HAZ-3: Hazardous Conditions During Construction at Broad Beach Construction activities at Broad Beach during nourishment and backpassing events could impact the safety of public beach users.	Mi	Slightly more adverse	Slightly more adverse	More adverse	Similar	Slightly more adverse	Slightly more adverse	Slightly more adverse	Similar	Similar
Impact HAZ-4: Potential for Sediment Placed on Broad Beach to be Contaminated Sediment material introduced to Broad Beach could impact public health and safety due to the chemical content of the new material.	Mi	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Impact HAZ-5: Burial of the Emergency Revetment Burial of the emergency revetment	B	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar

Table ES-3. Summary of Environmental Impacts for Project and Alternatives (continued)

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
could have short- to mid-term benefits to public health and safety.										
Section 3.7.6 Utilities and Service Systems										
Impact UTL-1: Project Increases Protection of Seaside Broad Beach OWTS Authorization of the emergency revetment, proposed supplemental sand bag installation, as needed, and creation of a wide sandy beach and new dune system would protect existing leach and drain fields from damage by wave action over the mid-term, preventing potential water pollution.	B	Much more beneficial	Much more beneficial	Much more beneficial	Similar	Much less beneficial	Much more beneficial	Less beneficial	Less beneficial	Similar
Impact UTL-2: Long-Term Exposure of OWTS to Coastal Erosion Limited nourishment events and granting permanence to substandard revetment construction would expose OWTS to damage from wave and tidal action over the long-term (e.g., 20+ years).	Mj	Much less adverse	Much less adverse	Much less adverse	Similar	Much more adverse	Much less adverse	Much more adverse	More adverse	Similar
Impact UTL-3: Effects on Existing Public Drainage Systems Construction of the revetment covered existing exposed public drainage pipes, and construction of the restored dunes and beach nourishment would potentially further bury or obstruct storm drains.	Mi	Similar	Similar	Similar	Similar	Less adverse	Similar	Similar	Similar	Similar
Section 3.7.7 Environmental Justice										
Impact EJ-1: Disproportionate Adverse Impacts to Minority and/or Low-income Populations due to the Emergency Revetment The presence of the emergency revetment impacts public access, and has the potential to disproportionately	N	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar

Table ES-3. Summary of Environmental Impacts for Project and Alternatives (continued)

Impact	Project	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9
affect minority and/or low-income populations.										
Impact EJ-2: Potential for Disproportionate Adverse Impacts to Minority and/or Low-income Populations due to Beach Nourishment at Broad Beach Beach nourishment activities would not have impacts that could disproportionately affect minority and/or low-income populations in the Project area.	N	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Impact EJ-3: Disproportionate Decrease in the Employment and Economic Base of Minority and/or Low-income Populations Residing in the County and/or Immediately Surrounding Cities Beach nourishment activities would not decrease the employment or economic base of minority and/or low-income populations.	N	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Impact EJ-4: Increased Area of Accessible Public Trust Lands Beach nourishment activities would increase the access to and enjoyment of public trust lands on Broad Beach.	B	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar
Impact EJ-5: Disproportionate Adverse Impacts to Minority and/or Low-income Populations due to the Transportation of Inland Sand to Broad Beach. Transportation activities may have impacts that could disproportionately affect minority and/or low-income populations in the BBGHAD Inland Project Area.	I	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar	Similar